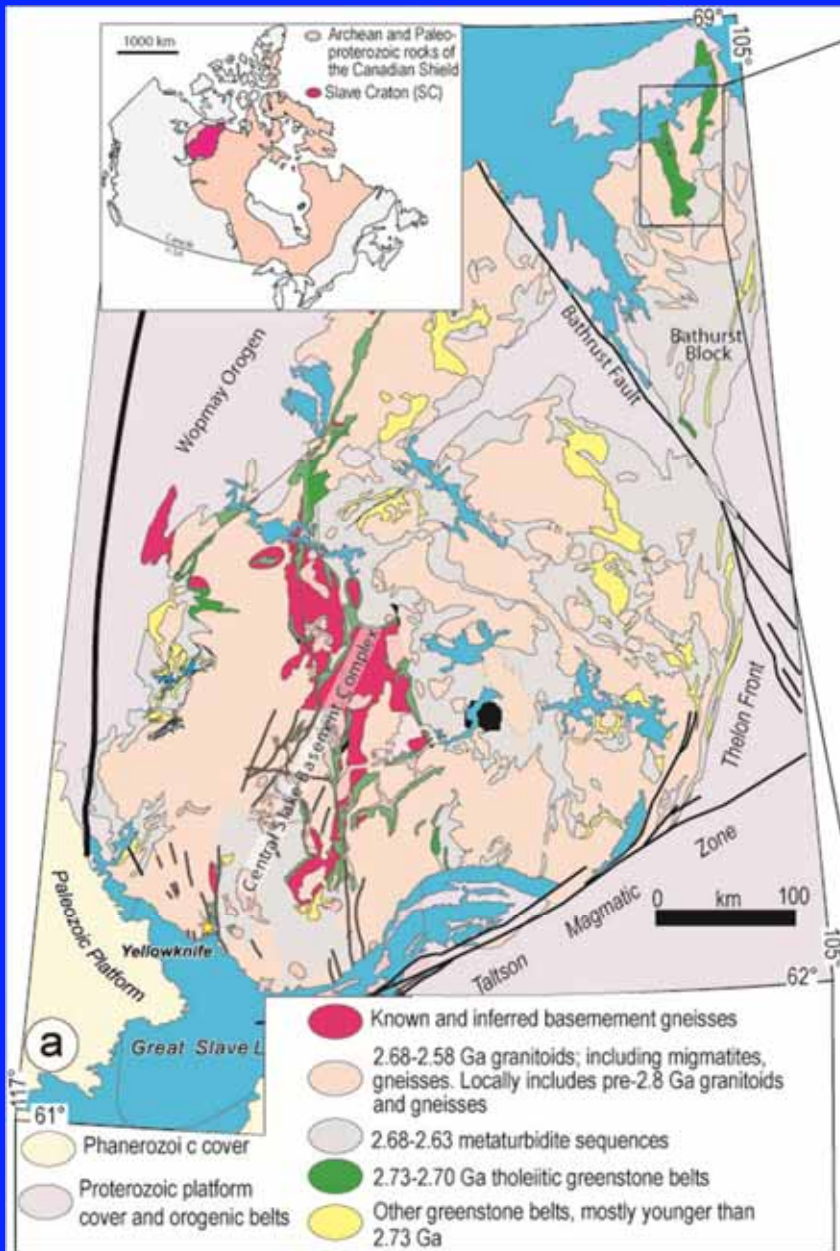


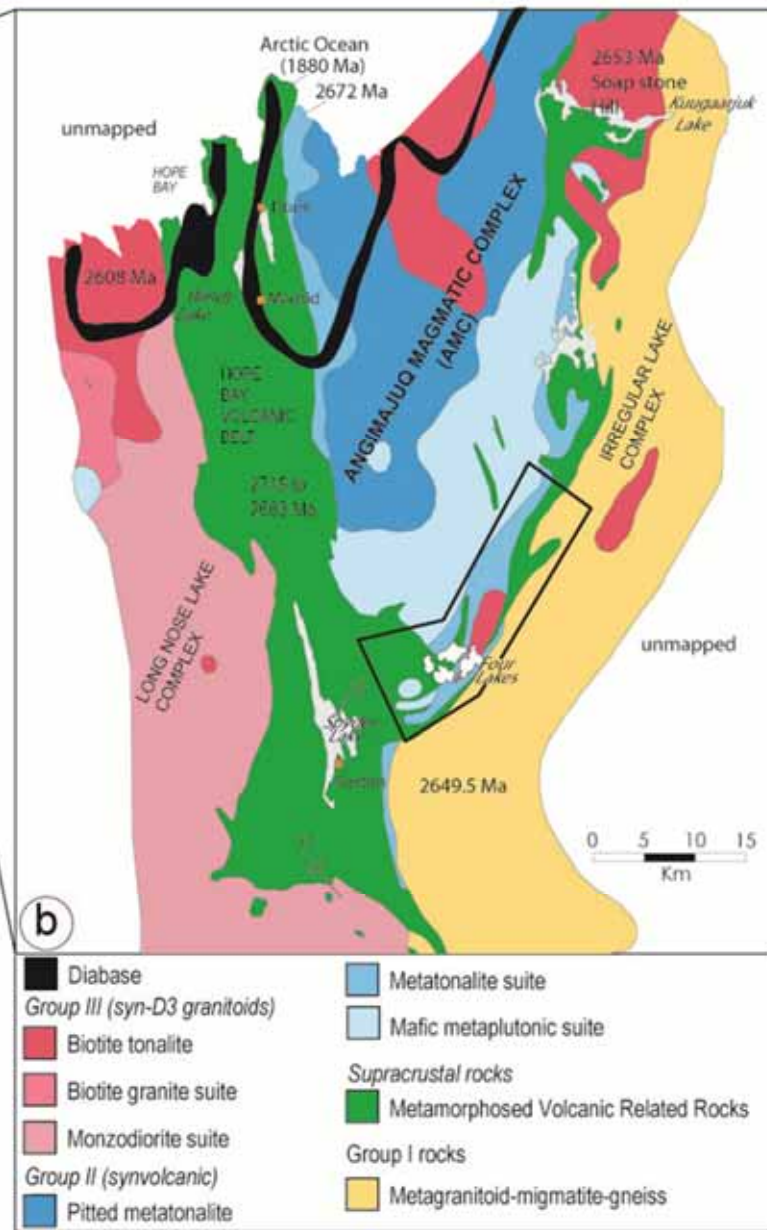
Timing of metamorphism and mineralization in the link between Hope Bay and Elu greenstone belts from microstructures and titanite U-Pb dates

H. Mvondo, D. Lentz, and M. Bardoux





Modified after Hoffman and Hall, 1993; Bleeker et al., 1999; Stubley, 2005; Shannon, 2008



Modified from Thompson, 1997

- Lithological and structural relationships?
- Deformation and metamorphic history?
- Distinction between Archean and Paleoproterozoic tectono-metamorphic imprints?
- Mineralization types and related controlling factors?
- Timing of deformation, metamorphism, and mineralization?
- Mineralization potential of the Elu Greenstone Belt?

Syn- to late-(D2+D3) rocks

Moderately to weakly foliated phaneritic equigranular hornblende ± biotite metagranite

Syn-D2 rocks

Moderately foliated and magnetic porphyrophaneric hornblende ± biotite metagranite

Porphyrophaneric, hornblende ± biotite metagabbros

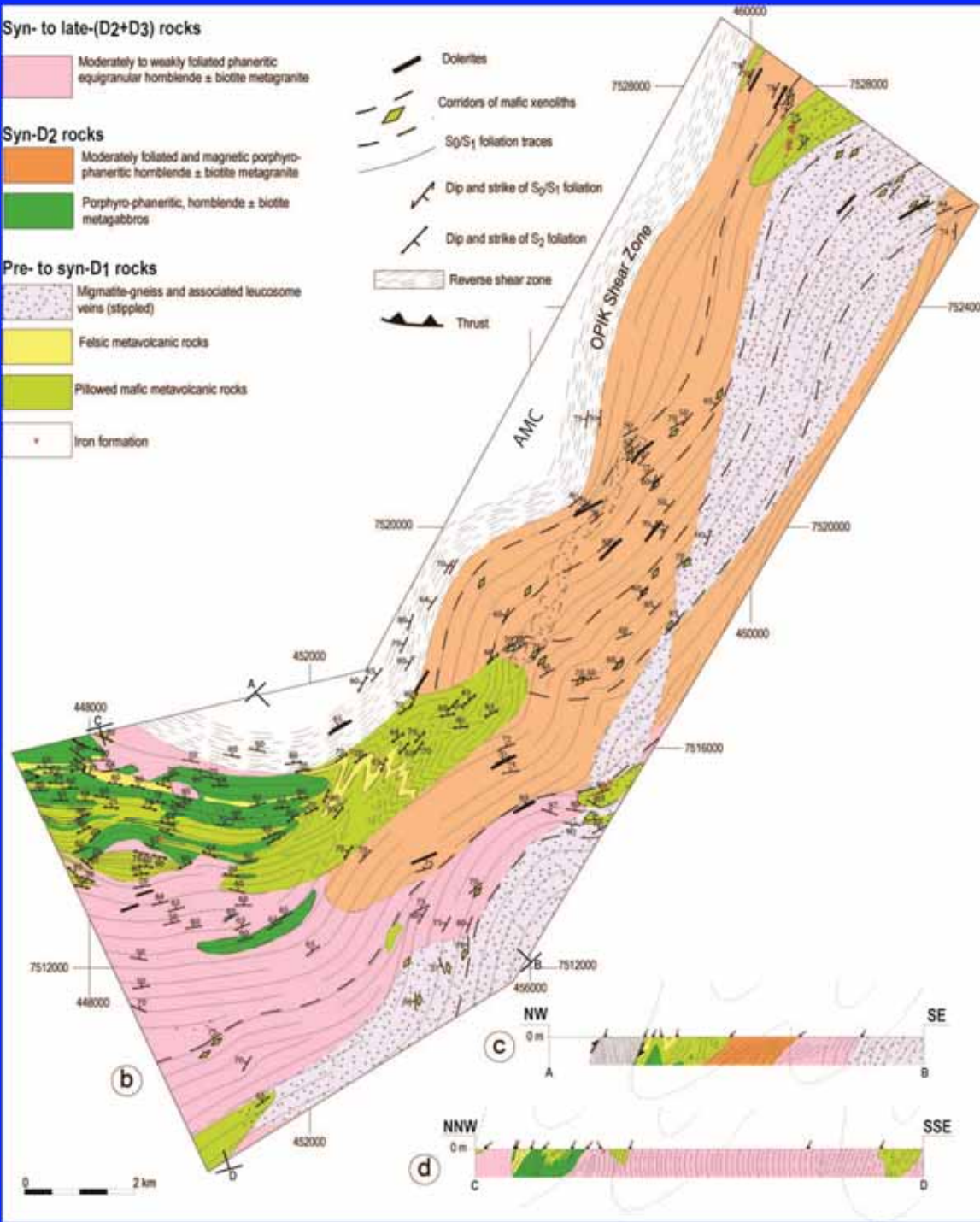
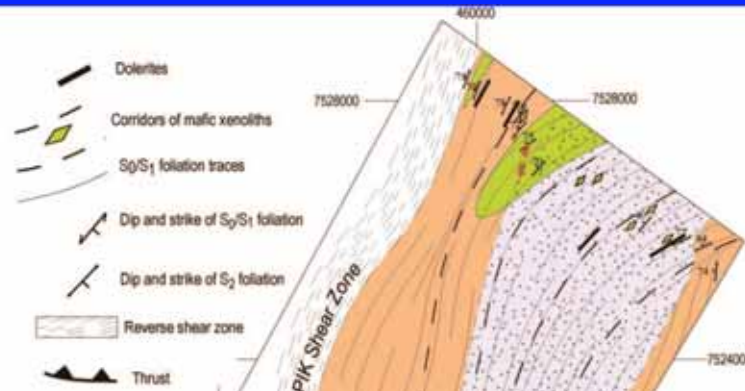
Pre- to syn-D1 rocks

Migmatite-gneiss and associated leucosome veins (stippled)

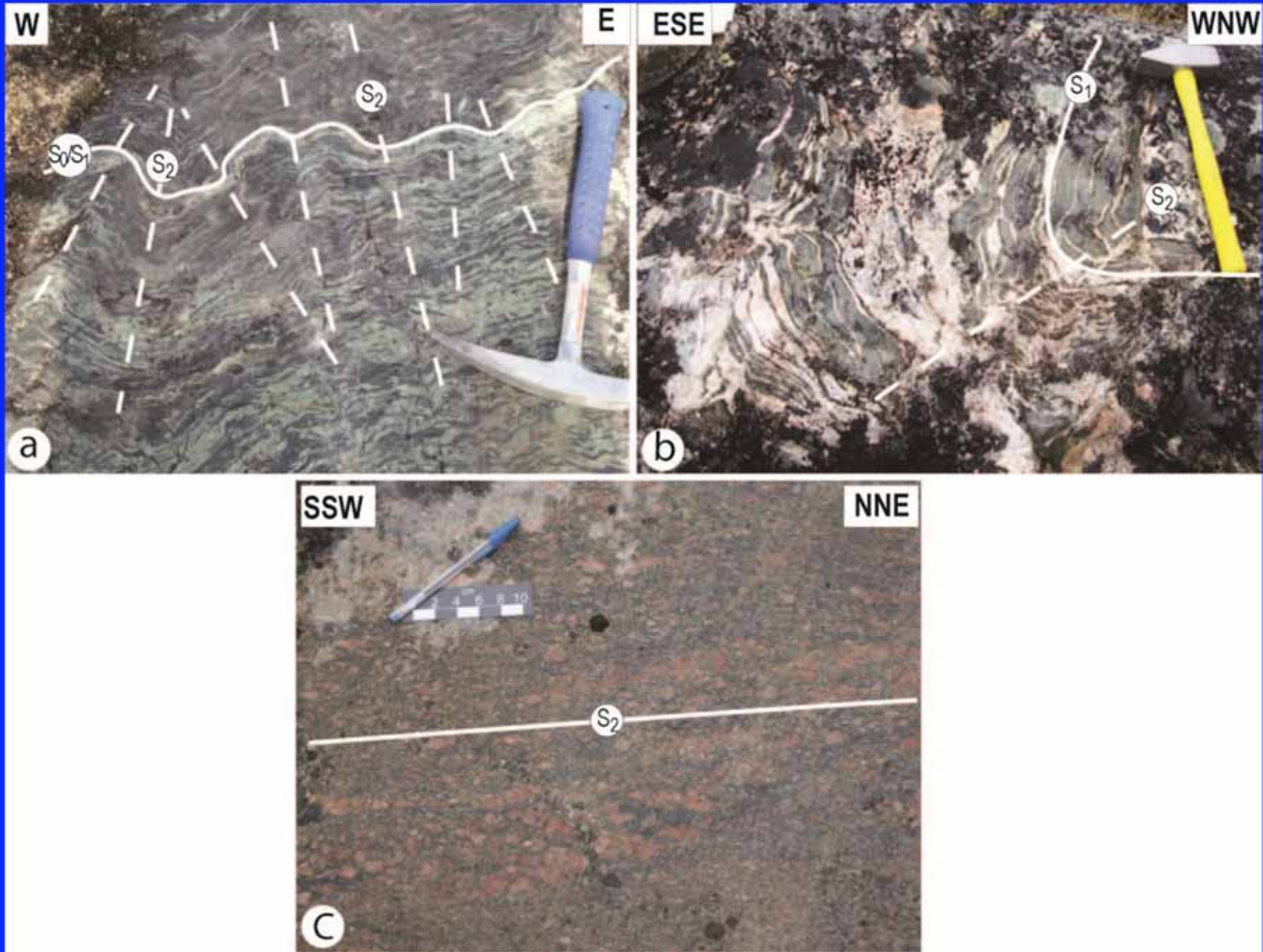
Felsic metavolcanic rocks

Pillowed mafic metavolcanic rocks

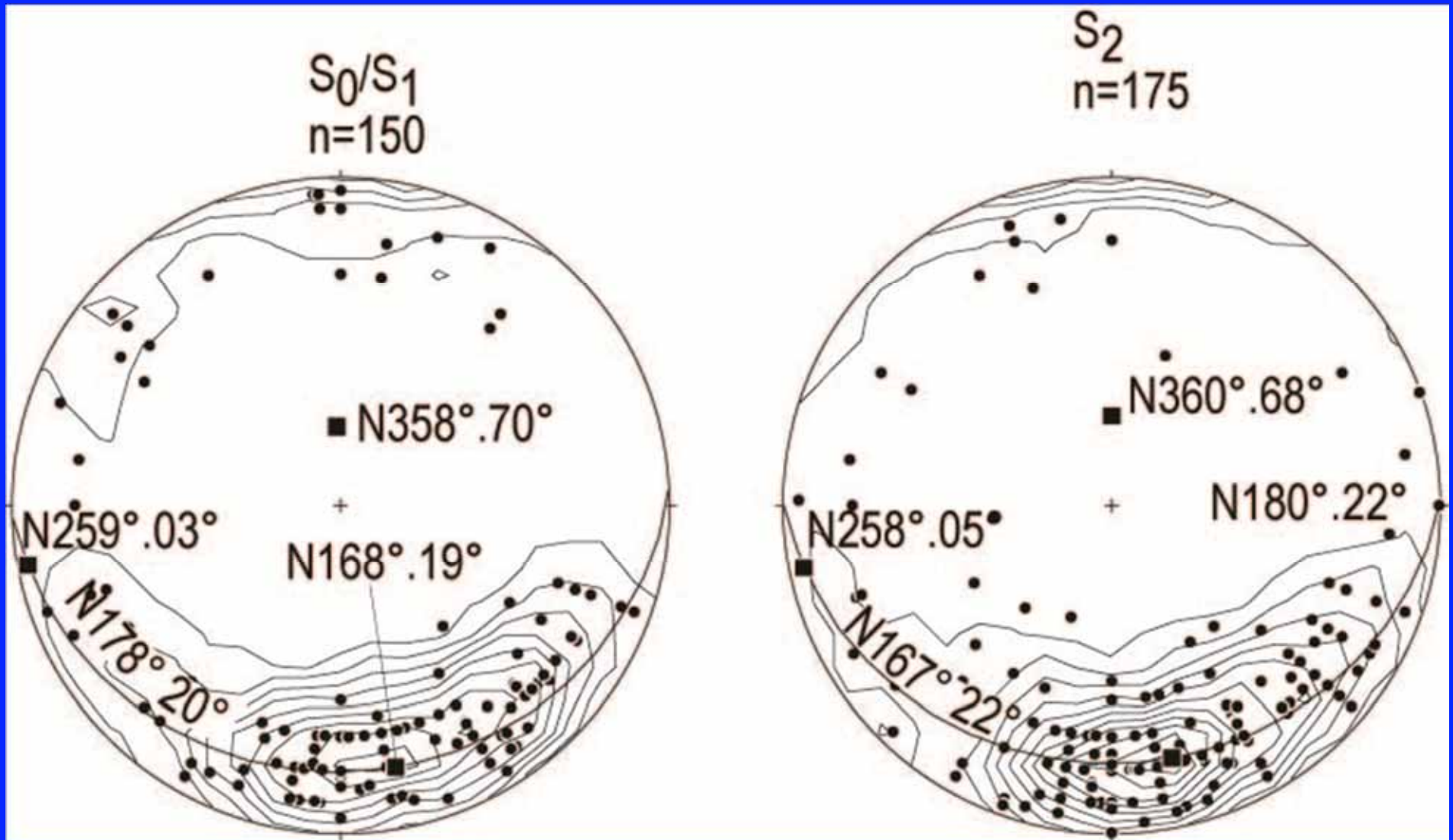
Iron formation



Fabric elements and deformation phases

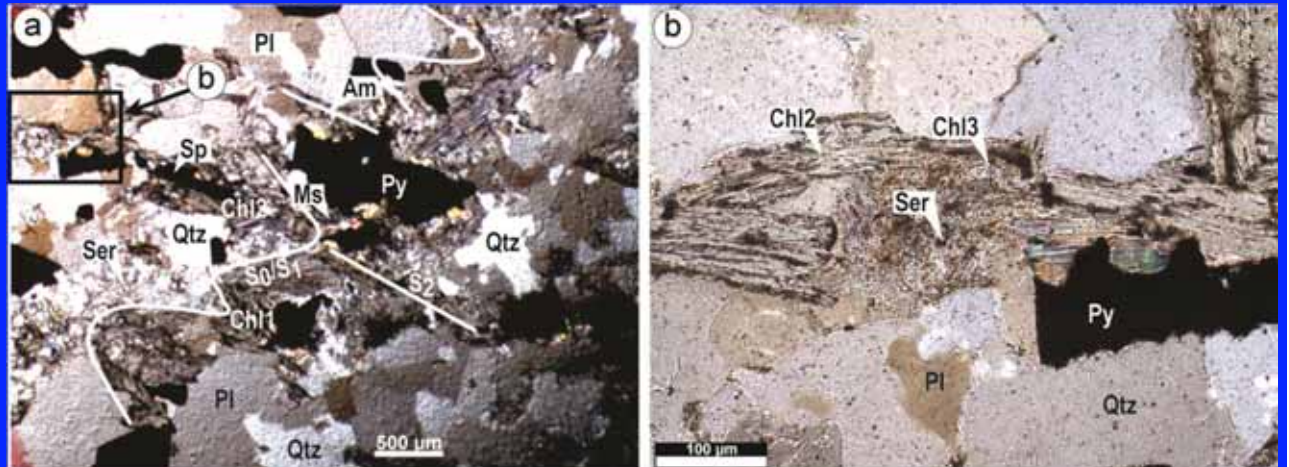


Fabric elements and deformation phases



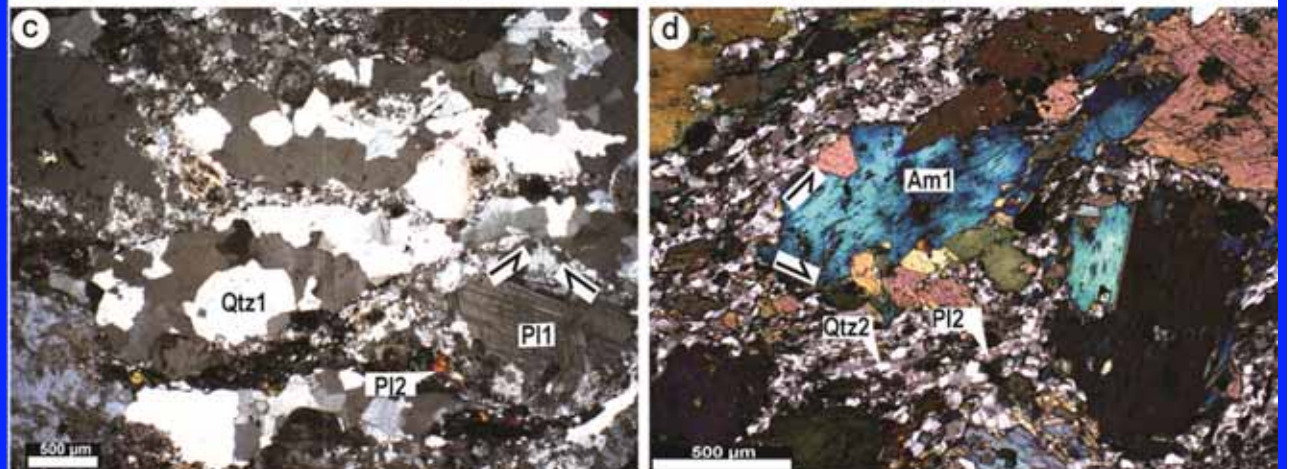
Supracrustal rocks:

$M_1(D_1)$, $M_2(D_2)$, and M_3
mineral assemblages



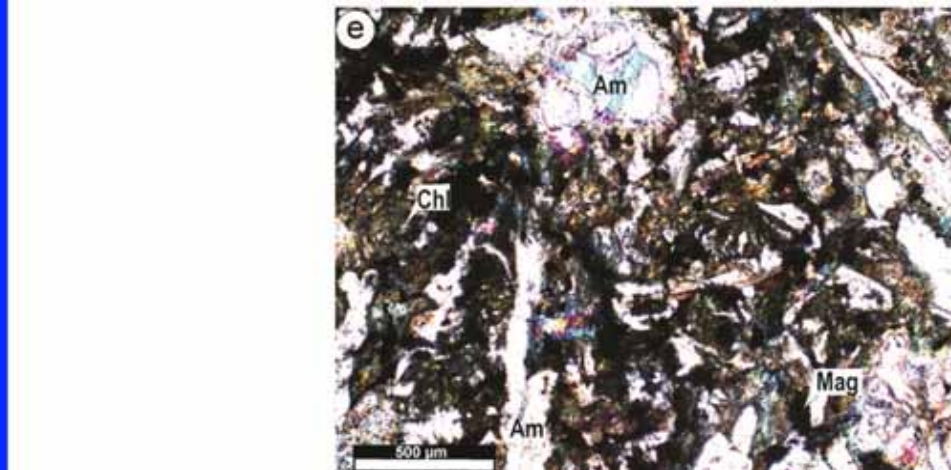
Metagranitoids:

M_0 , $M_2(D_2)$, and M_3
mineral assemblages

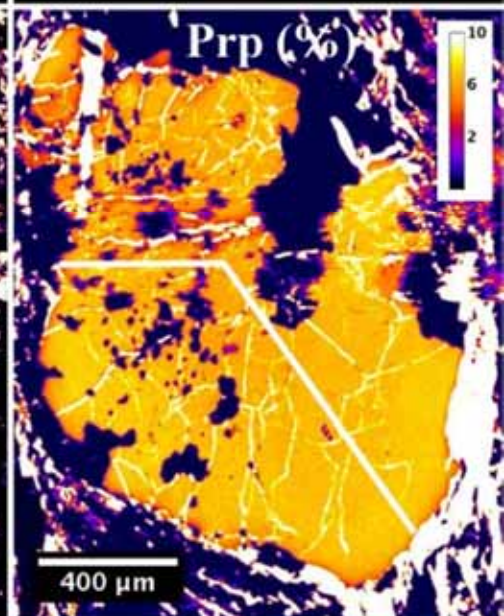
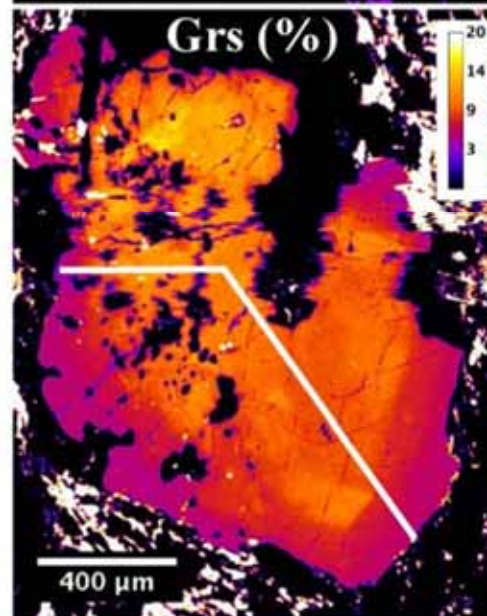
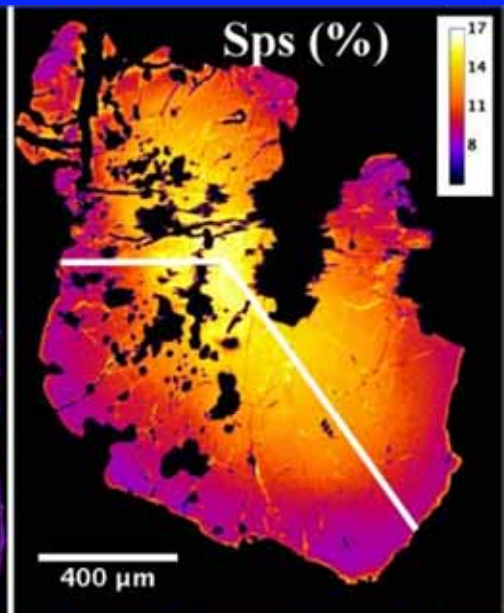
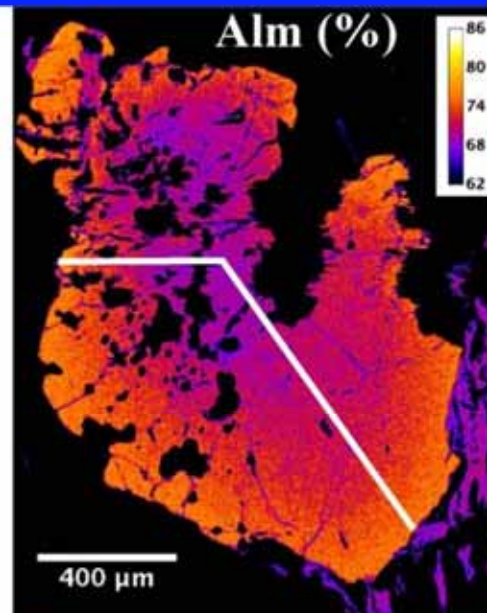
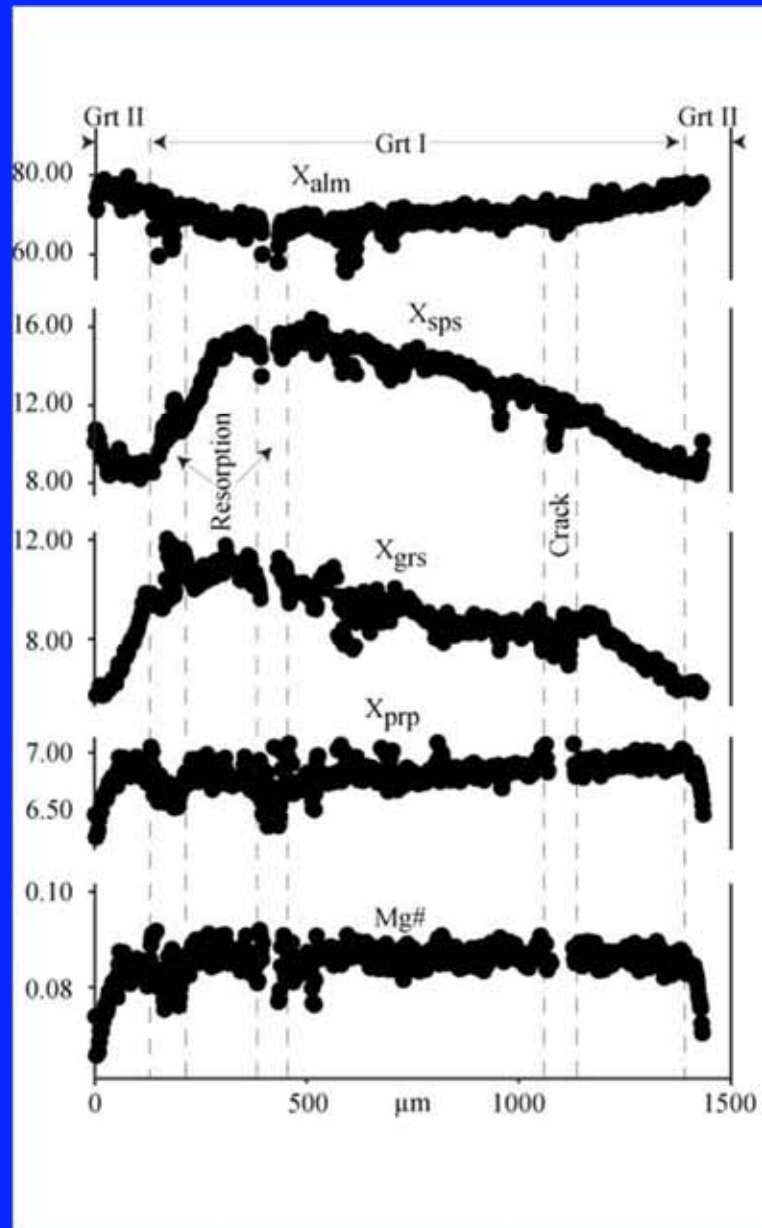


Dolerites:

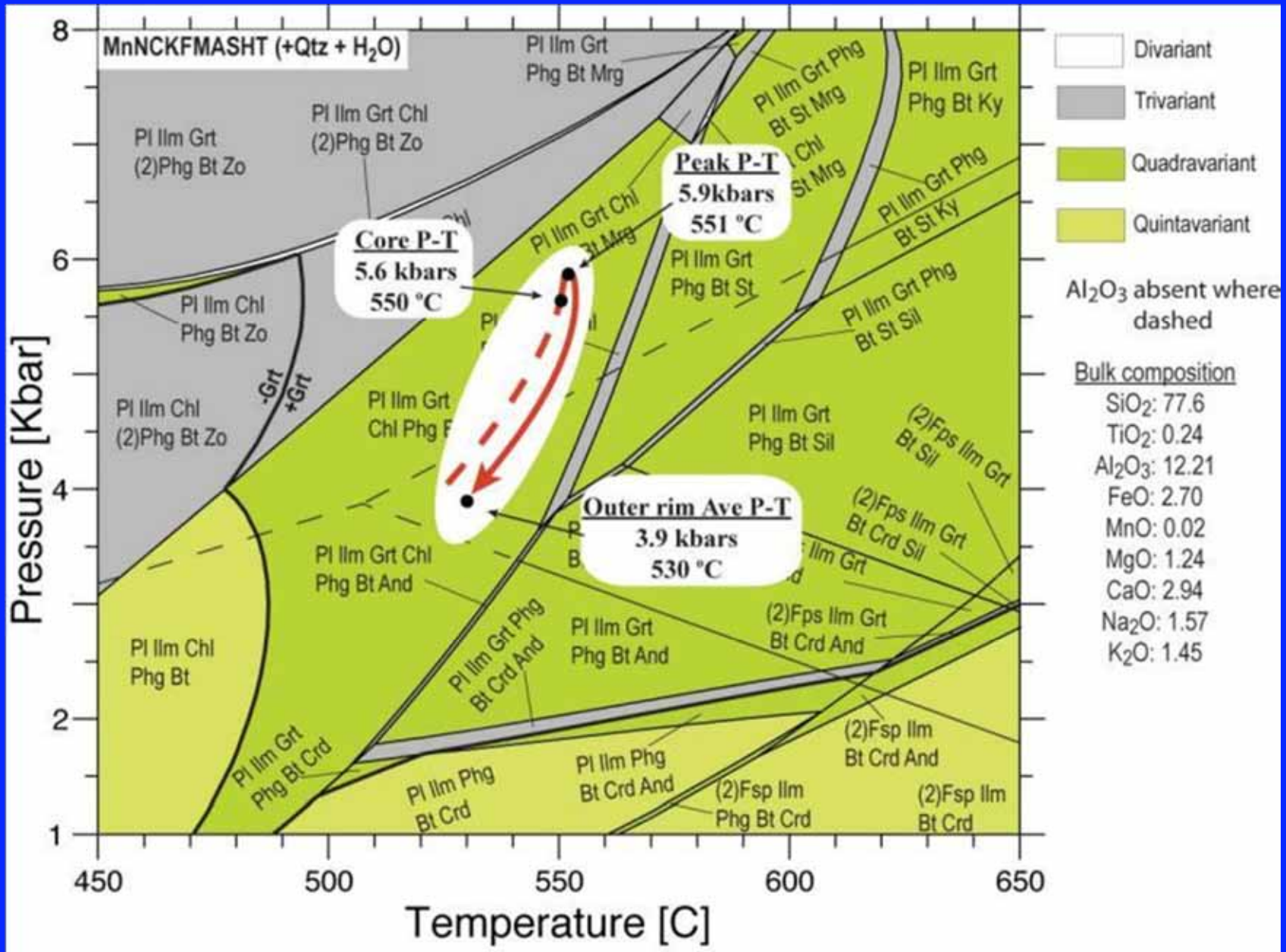
M_0 and M_3 mineral
assemblages



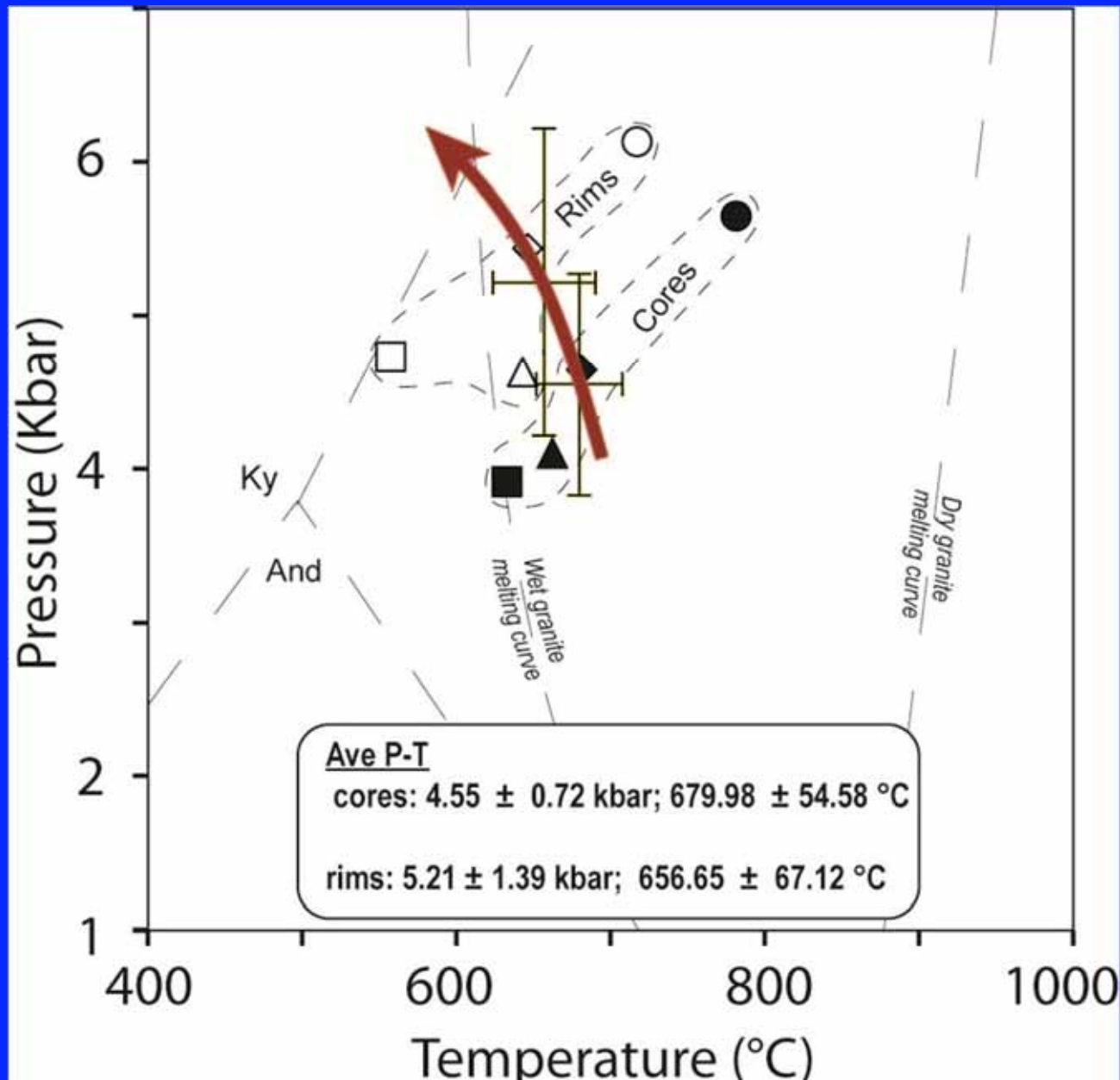
Grt growth zones in a Grt-bearing metarhyolite



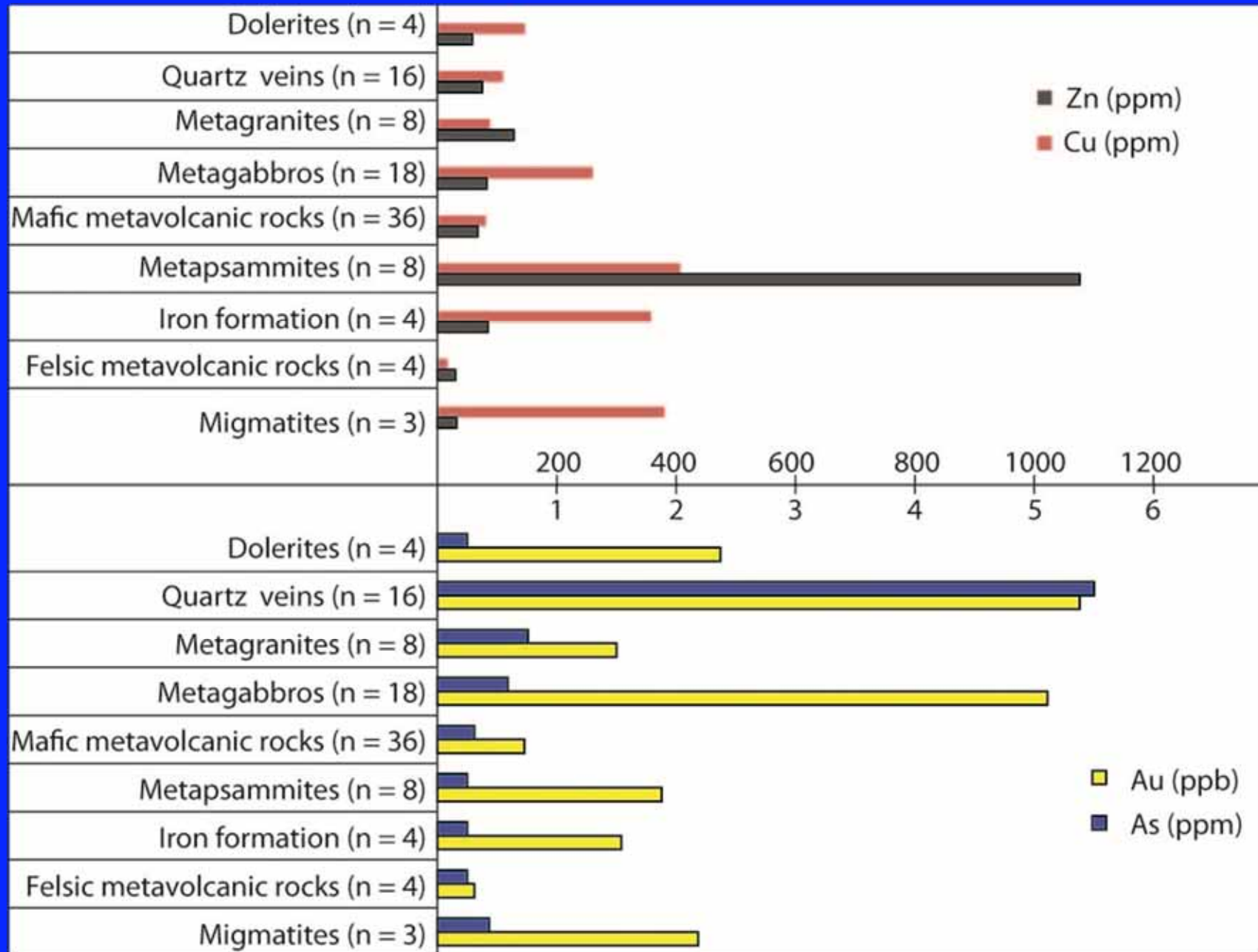
P-T path of a Grt-bearing metarhyolite



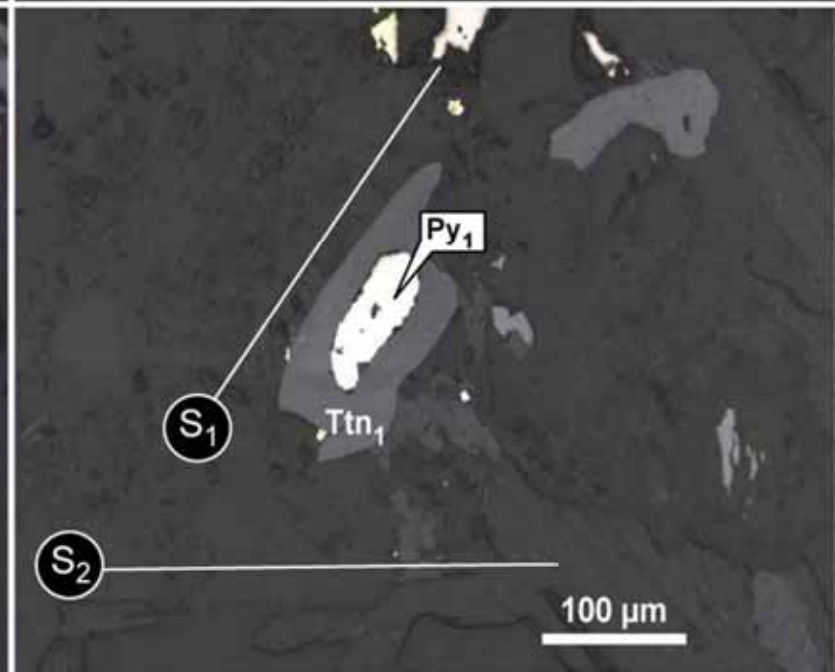
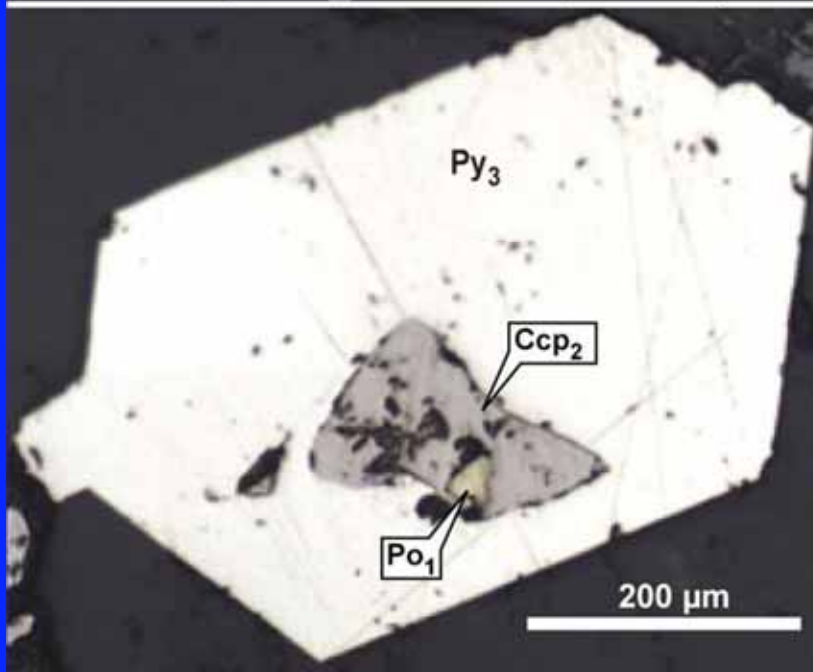
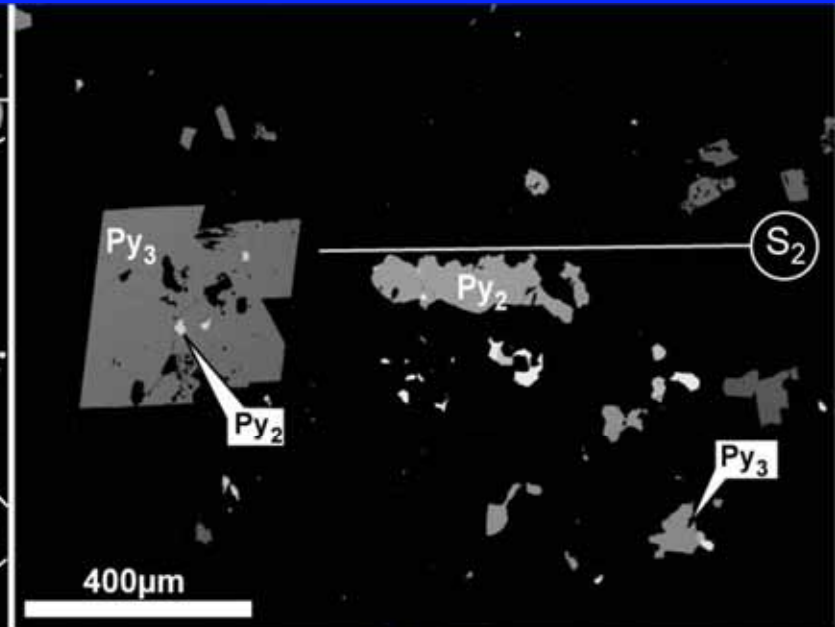
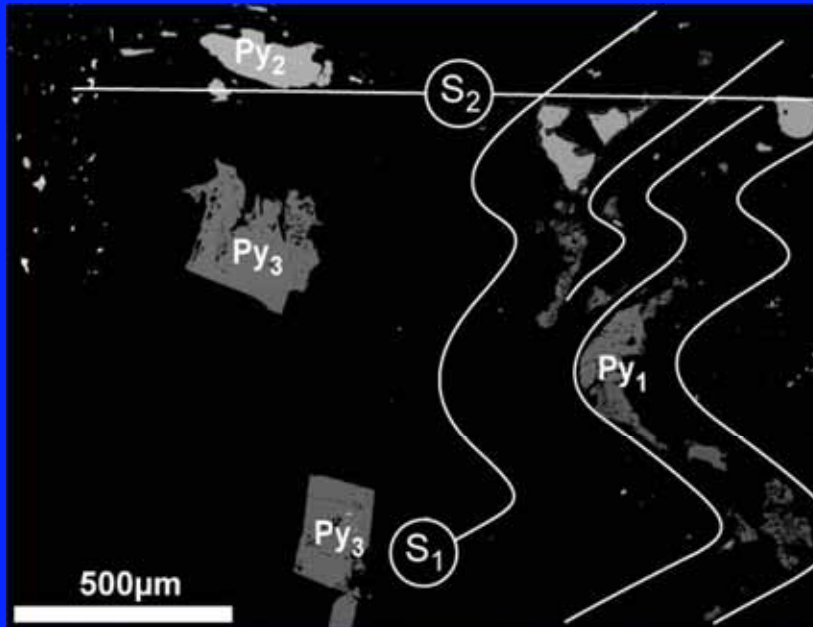
Hbl-Pl thermobarometry of syn- to late-D₂ metagranites



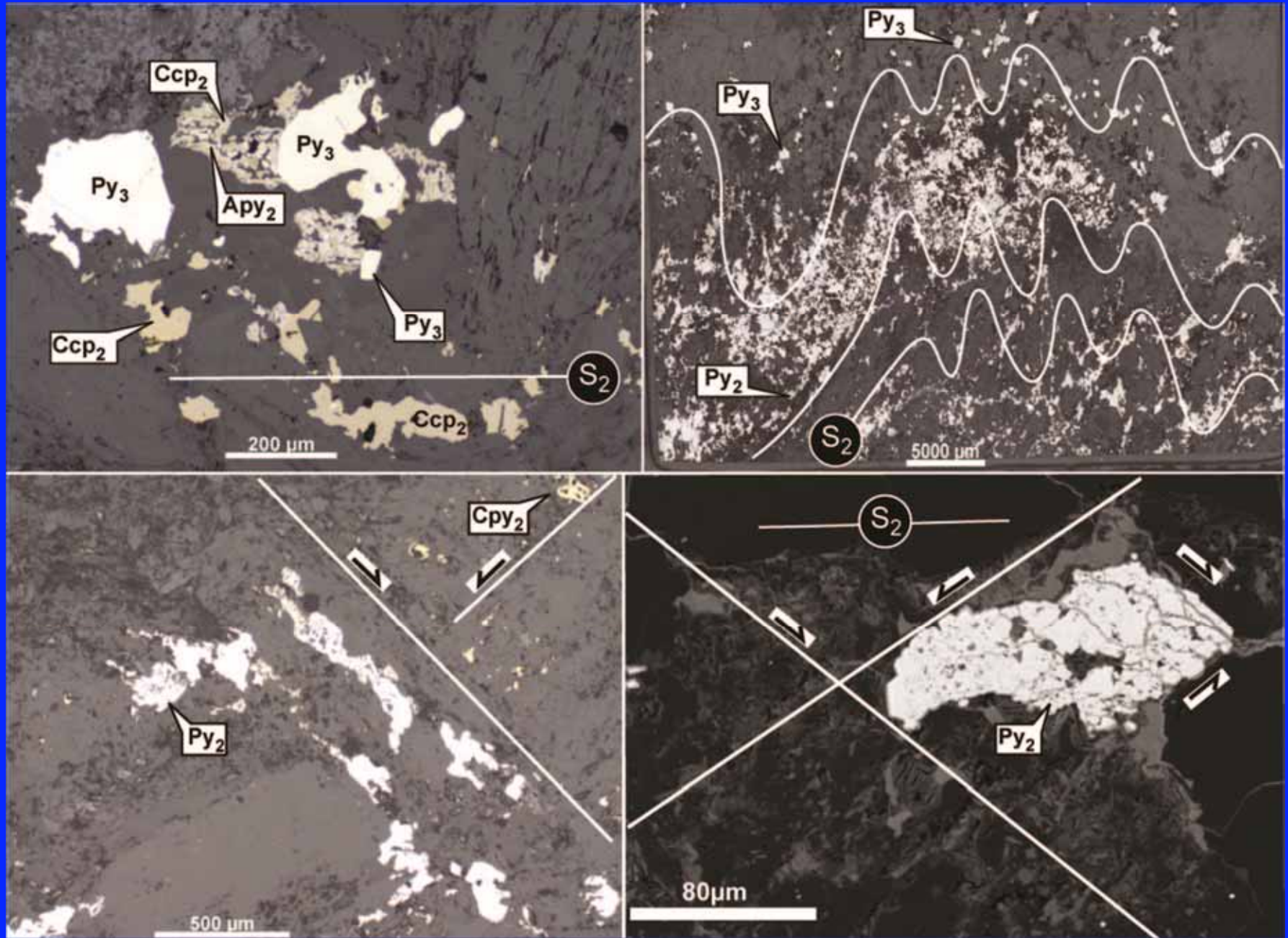
Au-As-Cu-Zn mineralization



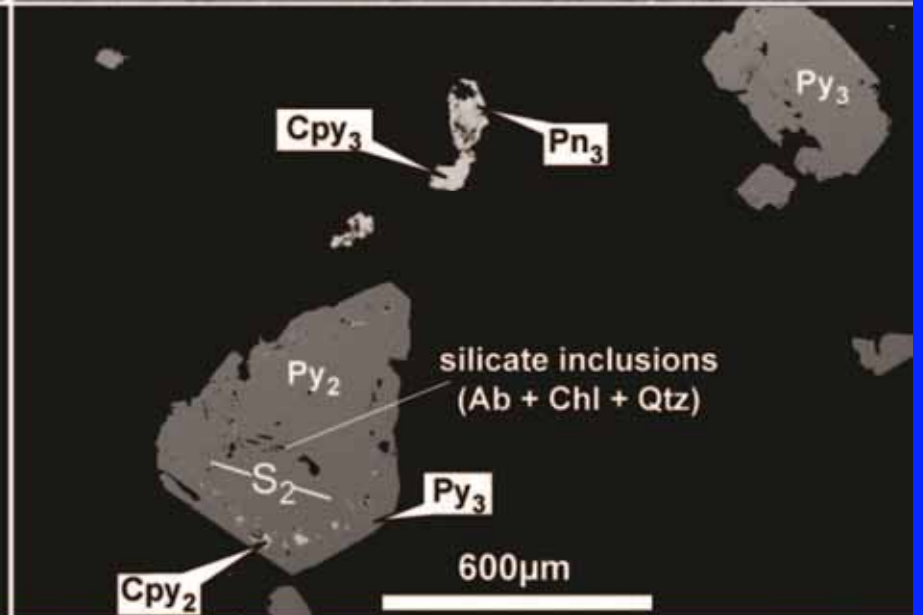
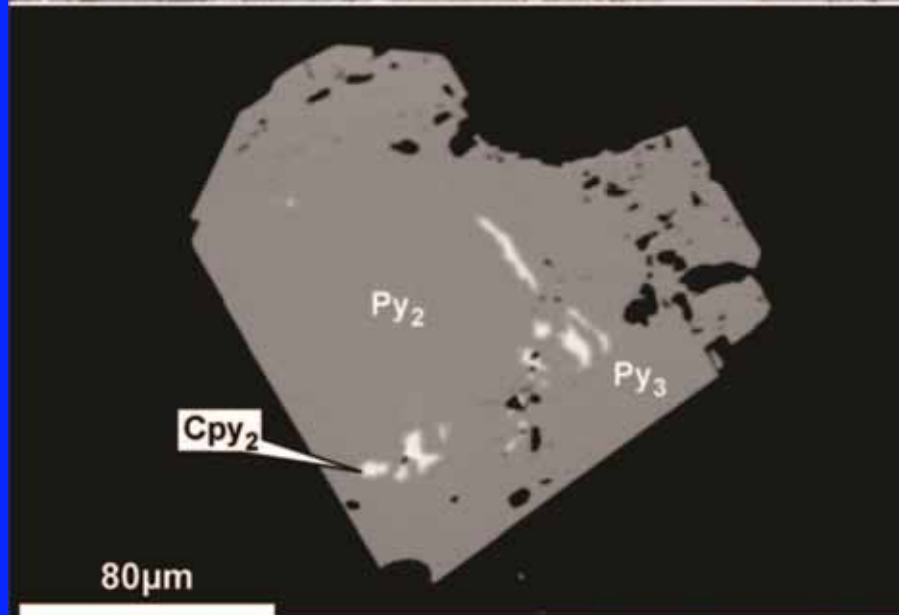
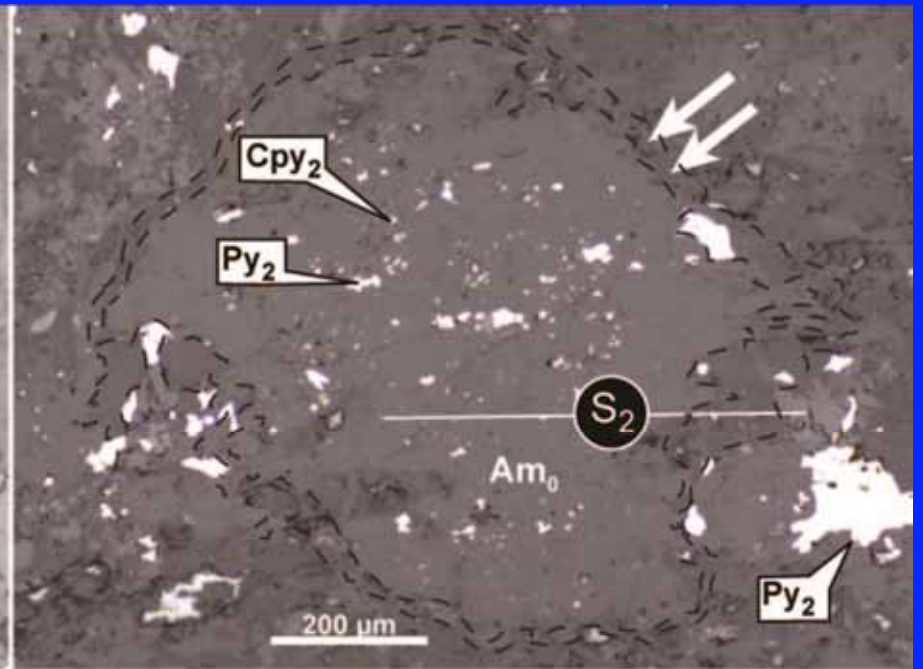
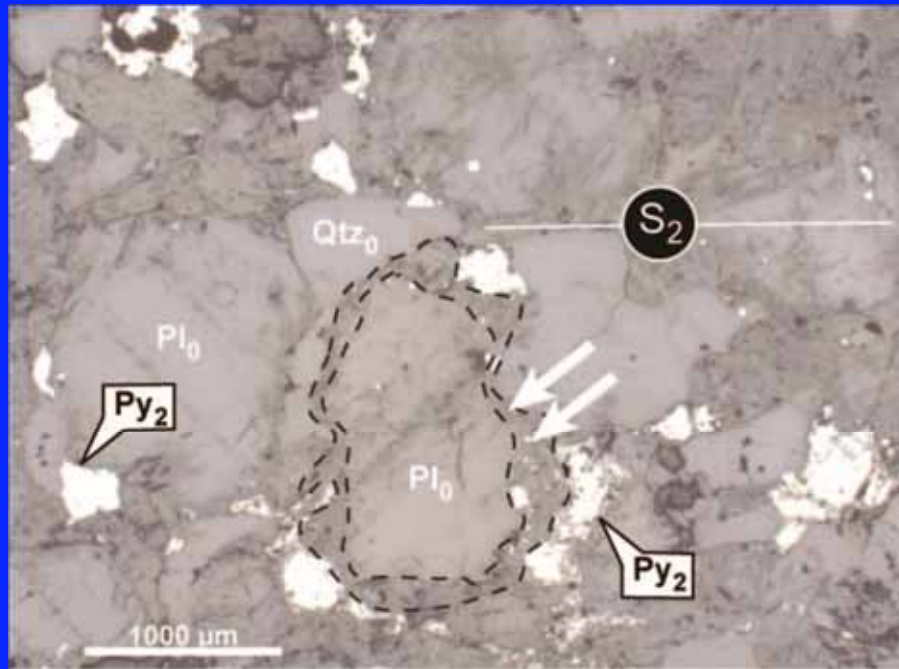
M₁-M₃ sulfides in supracrustal rocks



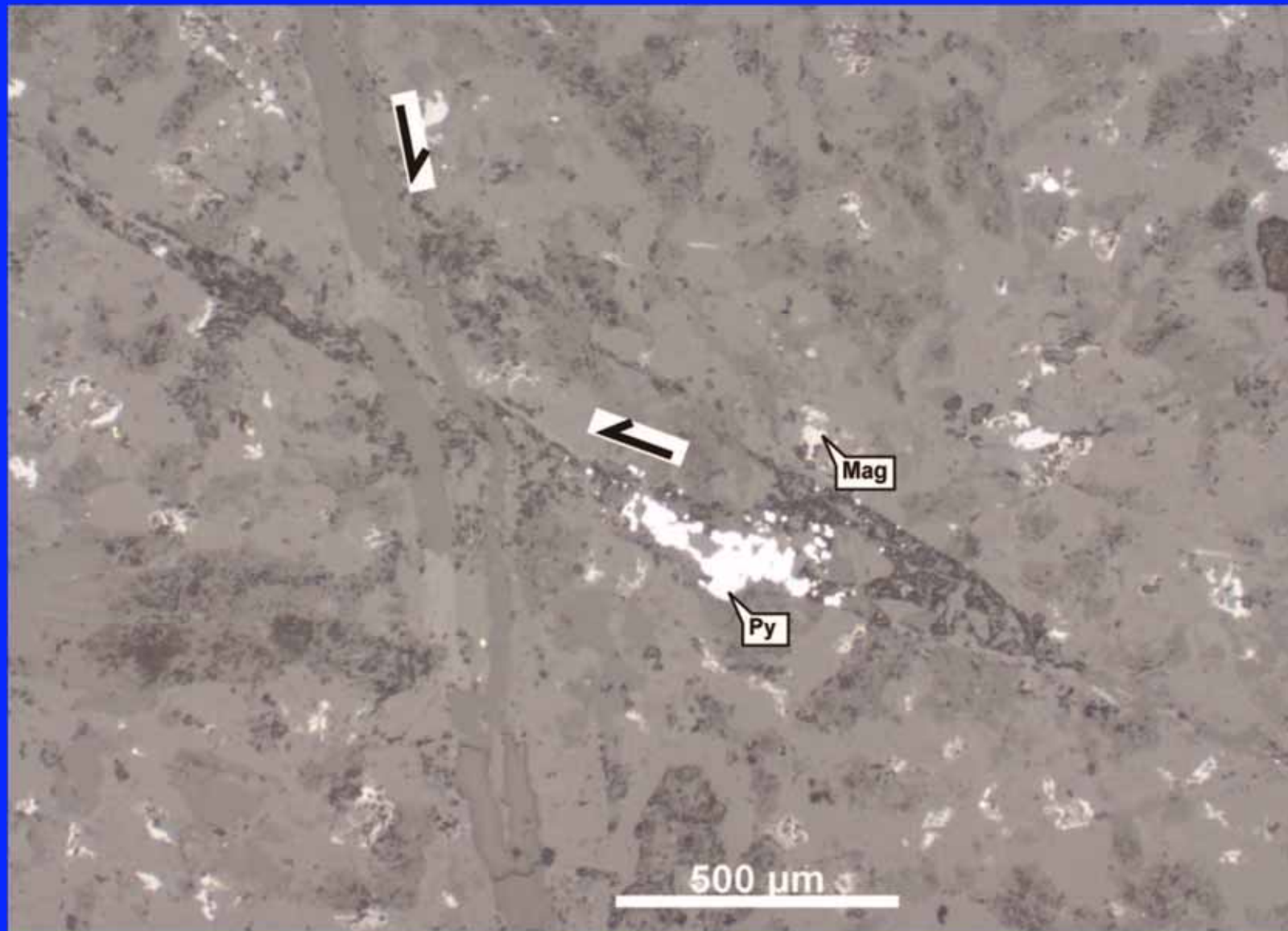
M₂-M₃ sulfides in syn- to late-D₂ metagranitoids



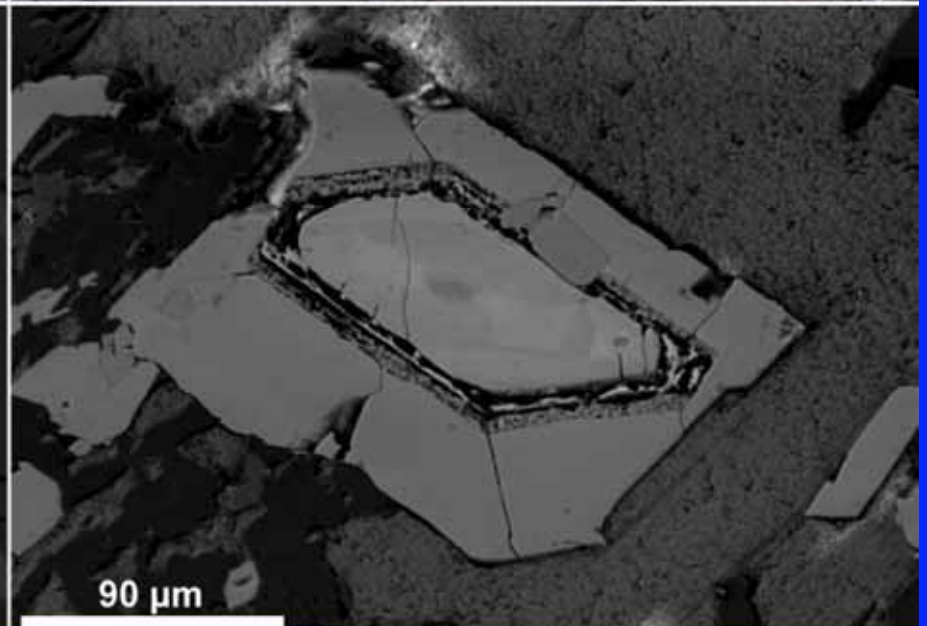
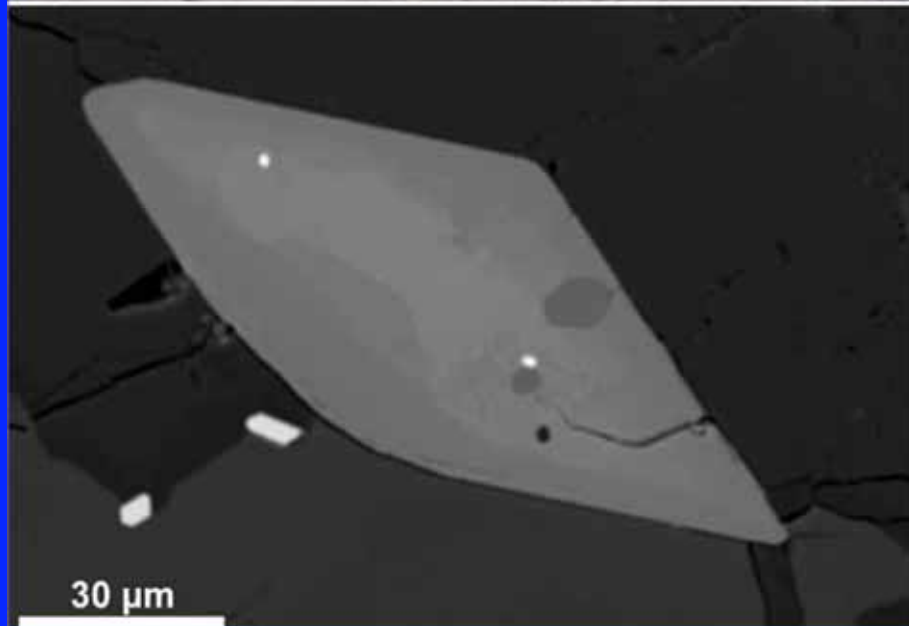
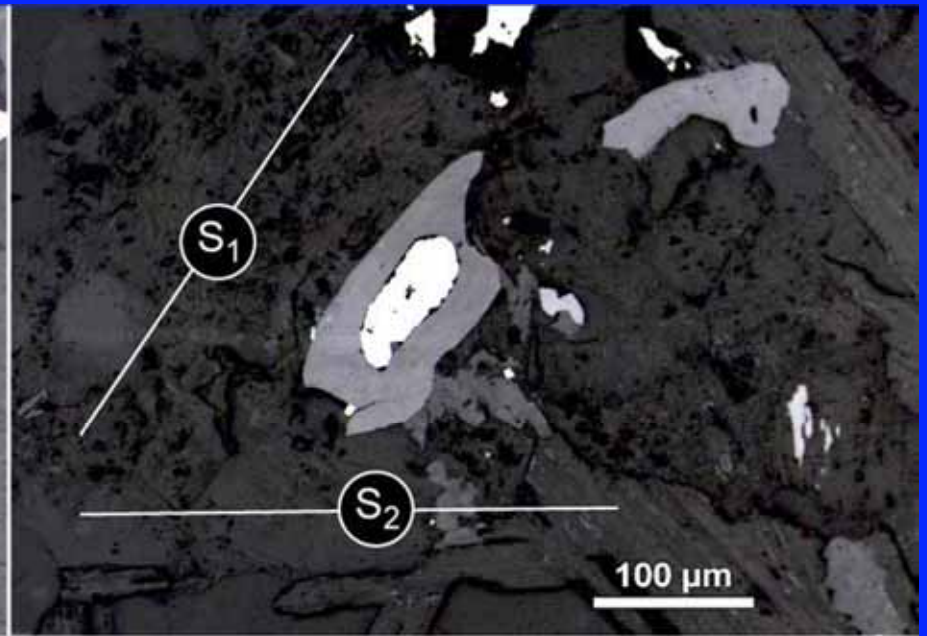
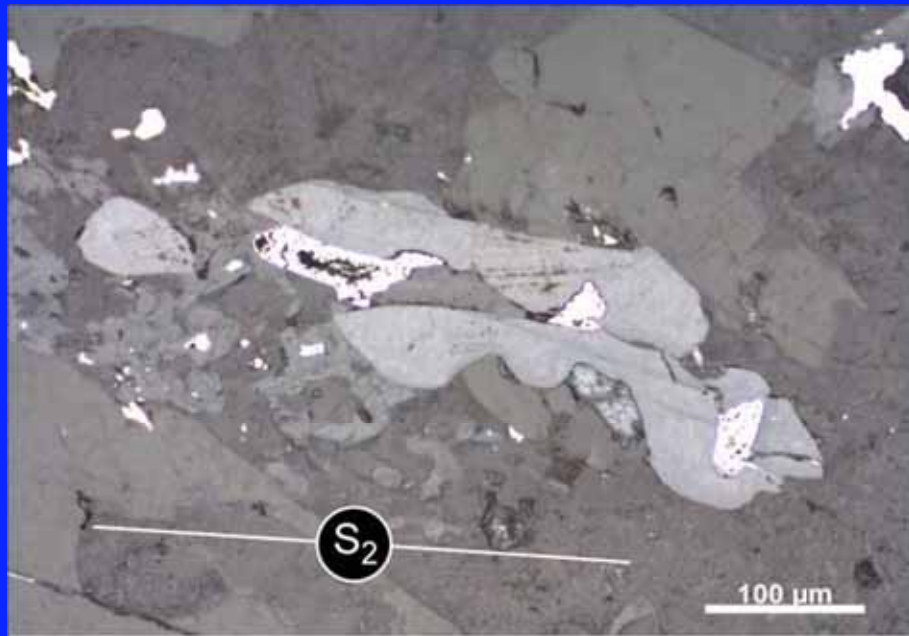
M₂-M₃ sulfides in syn- to late-D₂ metagranitoids



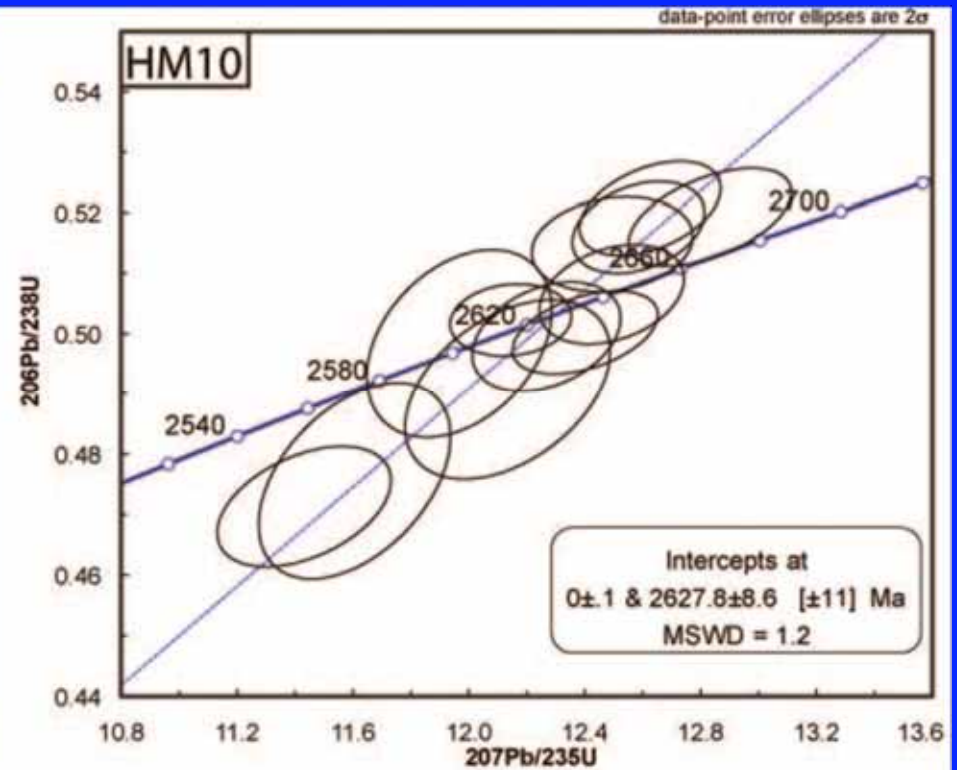
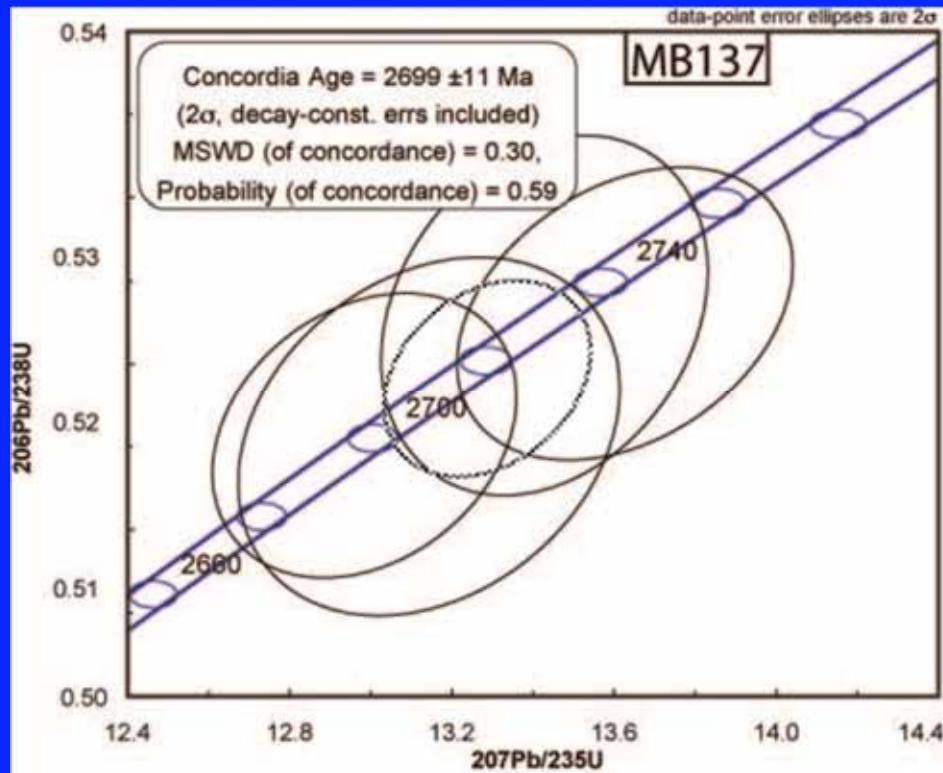
M_3 sulfides in Paleoproterozoic dykes



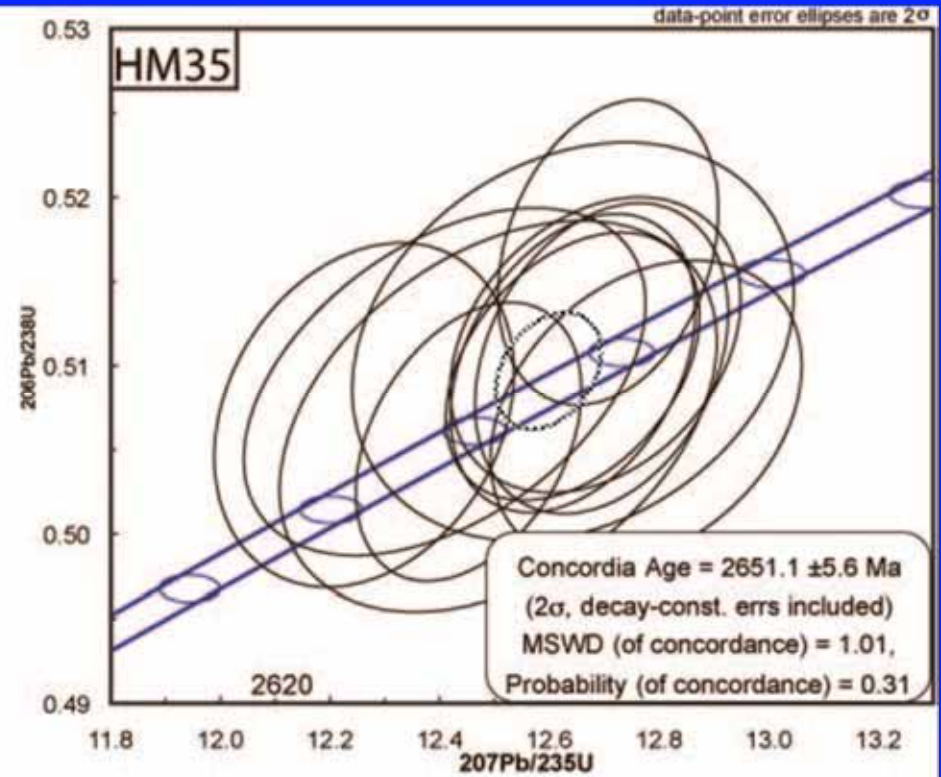
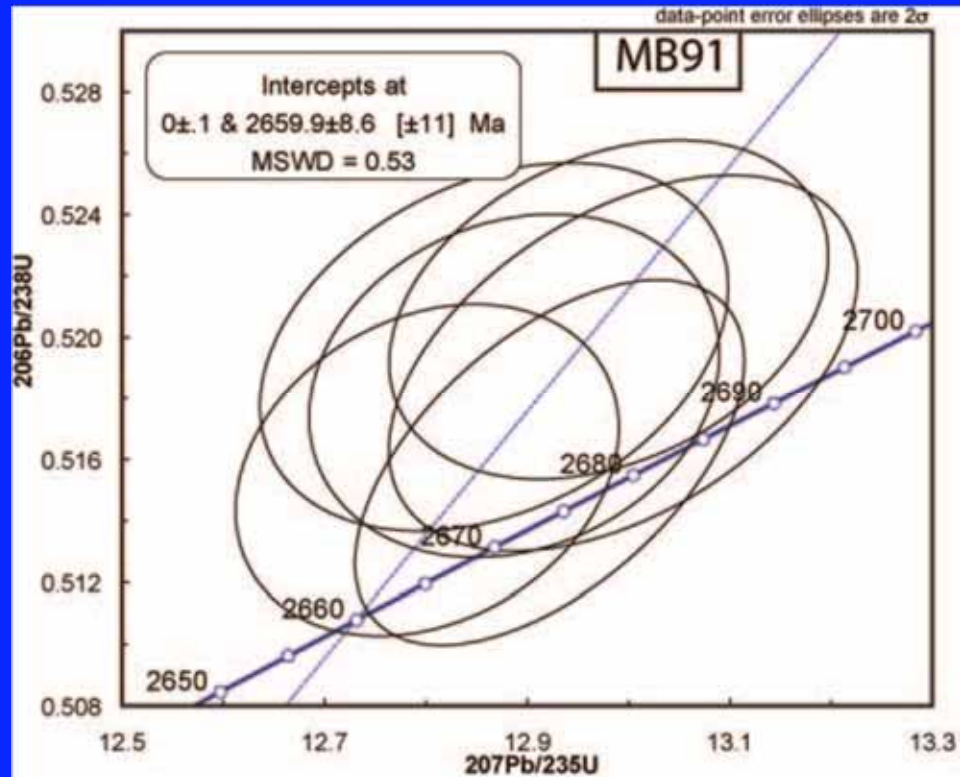
Titanite texture



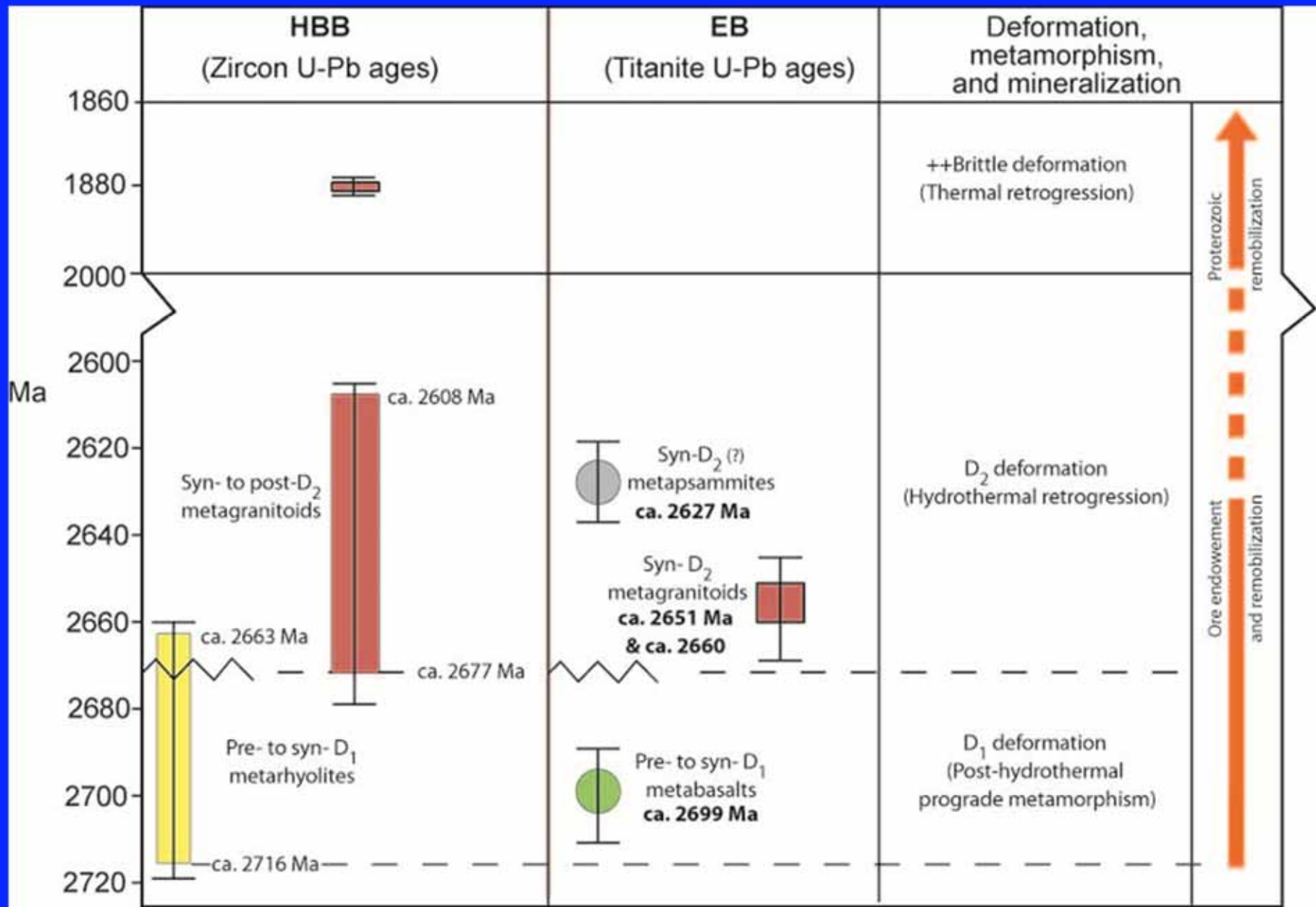
Titanite U-Pb ages of the supracrustal rocks



Titanite U-Pb ages of syn- to late-D₂ metagranitoids



Age correlations



(Zircon U-Pb ages from Bevier and Geber, 1991; Hebel, 1999; Shannon, 2008)

Summary

- ✱ D_1 deformation / post-hydrothermal prograde metamorphism with lower-amphibolite facies peak PT conditions; D_2 deformation / greenschist retrogression; and late brittle deformation / greenschist thermal retrogression.
- ✱ Prograde metamorphism and D_1 deformation have ca. 2699 - 2660 Ma titanite U-Pb ages, whereas retrogression and D_2 deformation are \leq ca. 2660 Ma. The brittle deformation and related greenschist thermal retrogression are Proterozoic
- ✱ Ca. 2699 and ca. 2627 Ma titanite U-Pb ages yielded by the supracrustal rocks may illustrate discordant rock sequences, whereas ca. 2660 Ma and ca. 2651 Ma metagranitoids likely reflect diachronous plutonism
- ✱ Sulfide textures and microstructures suggest continuous Archean metal (Au-As-Cu-Zn) endowment and Archean + Proterozoic metal remobilization.